Forest Health Protection
Pacific Southwest Region

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To: Sharon Heywood, Forest Supervisor, Shasta-Trinity National Forest

Subject: Potential Treatment Of Conifer Stumps To Prevent Heterobasidion Root Disease In The Bagley and Stafford Fire Areas of the Shasta-Trinity National Forest (FHP Report No. N13-03)

For the past six months, Cynthia Snyder (entomologist) and I have provided technical assistance regarding proposed post-fire recovery treatments at the sites of the 2012 Bagley and Stafford fires on the Shasta-McCloud/Shasta Lake, and South Fork Management Units, respectively. Most of this assistance was concerned with how to most effectively address hazard tree and timber salvage concerns. Recently, I was asked by Shasta-Trinity National Forest Silviculturists Keli McElroy and Randi Paris to provide recommendations on whether treatment of stumps with a borate fungicide immediately following cutting would be helpful in reducing the establishment of new infection centers of Heterobasidion (annosus) root disease in the two areas.

Treatment of freshly-cut stumps with either powdered or liquid EPA-registered borate compounds such as Sporax or Cellu-Treat has been found to be highly effective in preventing the spread of Heterobasidion root disease to adjacent host trees. This is done by preventing the colonization of stumps by aerially-disseminated fungal pathogen spores, which can then germinate and grow throughout the stump, infecting the roots of surrounding uninfected living trees via underground root-root contacts. A recent 2450/3400 letter from Regional Forester Randy Moore to Region 5 Forest Supervisors (darted May 13, 2013) stated that “New information from Region 5 State and Private Forestry (S&PF) forest pathologists indicates that stumps of trees affected by fire that have been dead less than 18 months are also susceptible to *Heterobasidion spp*. Therefore, treatment of these stumps is also important. Areas affected by the Bagley and Stafford fires clearly fall under this time frame.

A general recommendation in the Forest Service Handbook for National Forest lands in Region 5 (FSH 3409.11, Chapter 60, R5 Supplement 3409.11-2010-1) is to treat freshly-cut stumps that are 14 inches or larger in diameter in general forest land when, and in developed recreation areas or areas with high-value facilities or trees, to treat all stumps larger than 3 inches in diameter. While the 14-inch recommendation is mostly applicable to eastside pine stands, we often use it as a rule of thumb for westside pine and other conifer stands as well. However, in the end, the final decision on whether or not to treat rests with the appropriate line officer, who can base that decision on information provided by local Forest Health Protection staff such as myself.

The decision on whether or not to treat often depends on whether or not Heterobasidion root disease is present in the general vicinity of the area under consideration. In this

regard, the Handbook states that “If reliable surveys or biological evaluations conducted now, or in the past, indicate the disease is not present in the stand being managed, nor in neighboring stands that are within several miles, then there is no need to take preventative measures (apply borax) to prevent infection of cut stumps.” Although *Heterobasidion spp*. spores can travel long distances, I’ve considered the effective distance to be about three miles.

Since the areas in and around the two fire areas have not been intensively surveyed for Heterobasidion root disease, I asked Keli and Randi to check with local District personnel on whether they had previously seen definitive signs of the disease in the fire areas or in surrounding areas of their Districts. Retired Silviculturist Jeff Paulo, who knows the forests on the South Fork Management Unit better than anyone else, said that *Heterobasidion spp.* is not common in the Stafford project area. In contract, Shasta Lake Ranger District Forester said that he has seen *Heterobasidion* fruiting bodies in conifer stumps in Deadlun Campground, which is immediately adjacent to the Bagley project area. Although I have not worked extensively in these areas, I concur with these assessments. In my fourteen years on the Shasta-Trinity National Forest, I have never seen Heterobasidion root disease in the vicinity of Hayfork, and although I’ve not been in the Bagley area very much, the McCloud Flats area, approximately 11 miles north, has one of the highest concentrations of Heterobasidion root disease in the state. I would not be surprised if more was present further south in or near the Bagley area.

To further assess the potential presence or absence of Heterobasidion root disease in the two project areas, I asked Leo Liu (GIS/Remote Sensing Analyst for Region 5 Forest Health Protection) to run a query in the newly-developed CAIDA (California Insect and Disease Assessment) database to see if there have been any past reports of the root disease in or around the two fire areas. The CAIDA database is a geospatial database that contains historical Forest Health Protection insect and disease detection, survey and evaluation reports for the last 50-plus years. The results from the queries are in Figures 1 and 2. The red boxes each represent a report of the disease.

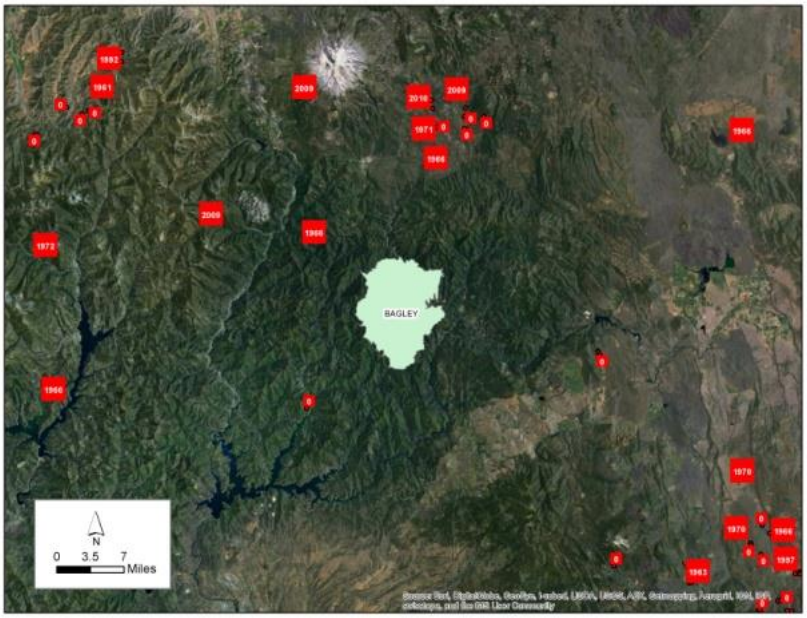

Figure 1. Historical reports of Heterobasidion root disease in the vicinity of the Bagley Fire Area from the CAIDA database.

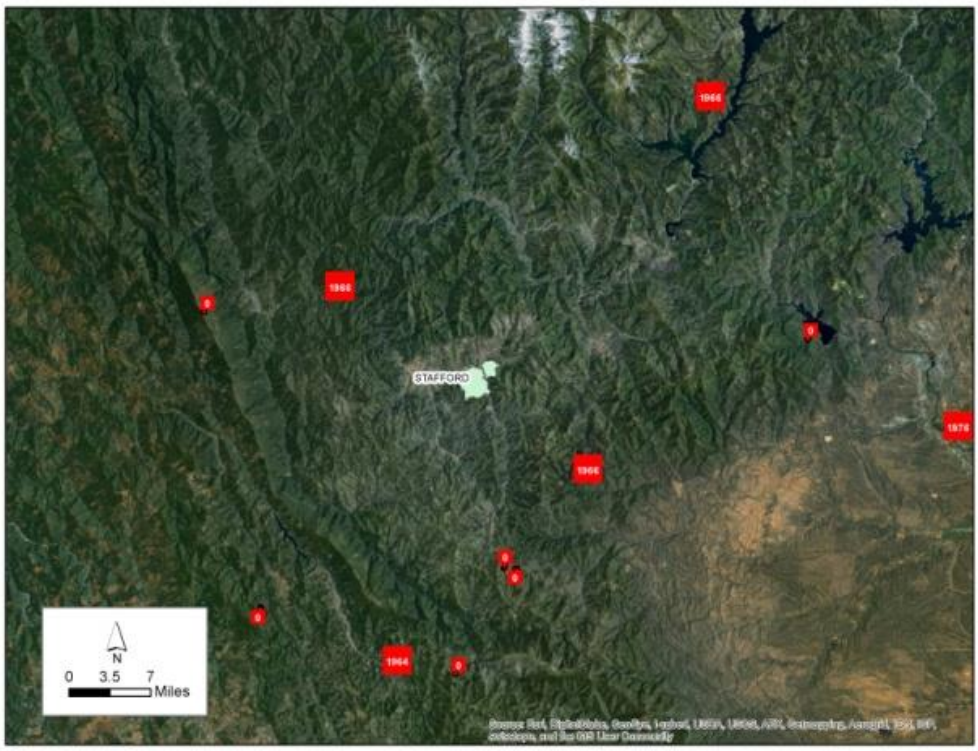

Figure 2. Historical reports of Heterobasidion root disease in the vicinity of the Stafford Fire Area from the CAIDA database.

The CAIDA database, which shows the historical reports of Heterobasidion root disease, did not show any disease reports within or within several miles of the each fire area. Figure 1, which shows reports in the vicinity of the Bagley Fire Area, shows two reports to the northwest and southwest, about 8-10-miles away. The large number of reports at McCloud Flats, which has a very high concentration of root disease, can be seen north of the Bagley area. Overall, the Stafford map shows far fewer reports of Heterobasidion root disease in the vicinity. The nearest ones are at least 10 and 11 miles away, to the southeast and northwest, respectively.

Recommendations And Conclusions

Taken alone, the CAIDA database does not show any Heterobasidion root disease that is close enough to be a concern in either the Bagley or Stafford fire areas. However, it does support what myself and others generally know about each area- that there is easily more Heterobasidion root disease around the Bagley area than the Stafford. Again, one of the highest concentrations of the disease in the state, at McCloud Flats, is approximately 11 miles away from the Bagley area. The reported presence by Todd Hamilton of the root disease at Deadlun Campground, which is immediately adjacent to the Bagley fire area, confirms my suspicion that there is likely more. In contrast, at the Stafford area, neither CAIDA, nor the knowledge and experience of myself or Jeff Paulo indicates that there is any Heterobasidion within several miles.

In conclusion, **I recommend that freshly cut stumps in the Bagley area be treated with borax fungicide according to the recommendations in Forest Service Handbook (as stated above).** The reported presence of the pathogen at Deadlun

Campground alone is reason enough to proceed with the treatment, and there is every reason to suspect that there is more in the area. **In contrast, the decision to treat freshly cut stumps in the Stafford area is more of a judgment call.** If you want to be sure to prevent the establishment of new root disease centers, then go ahead and treat the stumps. I've always considered the treatment of stumps to be a form of "cheap insurance". However, even with that in mind, it seems unlikely that a significant number of new Heterobasidion root disease centers will become established, even if the freshly-cut stumps are left untreated. For this reason, **I do not have a major problem or concern if the freshly cut stumps in the Stafford area are not treated.**

However, in both the Bagley and Stafford areas, freshly cut conifers in developed recreation areas or in high-value sites must be treated, as stipulated in both the Forest Service Manual (FSM 2300, R5 Supplement 2300-92-1) and Handbook (FSH 3409.11, Chapter 60, R5 Supplement 3409.11-2010-1).

If you have any questions regarding this report or need additional information, please contact me at 530-226-2436.

/s/ Pete Angwin

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